Technical Data

DATA SHEET 136.50 8/5/66

TYPE 354 RECEIVER

The CEI Type 354 Receiver is a newly-developed unit based on the popular CEI 351 Receiver. It differs from the 351 primarily in that it has a calibrated metal tape for the tuning dial rather than an internal digital counter. The 354 Receiver has an unusually wide tuning range, variable IF bandwidths, and high tuning accuracy. It tunes from 1 kHz to 600 kHz in a single band, thus spanning the ELF band through the VLF and LF bands into the MF band. A front-panel switch allows the selection of a 150 Hz, 1 kHz, 3 kHz, or 6 kHz IF bandwidth. Crystal bandpass filters are used to determine all IF bandwidths. The receiver's 600-kHz tuning range is spread over 25 inches of dial tape.

The low incidental FM of the local oscillator and extremely versatile BFO section makes the 354 Receiver suitable for FSK and SSB, as well as AM and CW reception. There are five separate beat frequency oscillators. One has a variable frequency which may be shifted 7 kHz each side of the 2-MHz IF center frequency. The other four oscillators are crystal controlled and provide outputs which zero beat with the IF frequency, give a 5.5-kHz beat note, and give upper or lower sideband reception of SSB signals (depending on the sideband transmitted) when used with the 3-kHz IF bandwidth.

This extremely versatile receiver has been designed using solid-state devices exclusively as active elements. It, therefore, exhibits high reliability and low power requirements.

SPECIFICATIONS

Frequency Range	1 kHz to 600 kHz (lower Band limit 500 Hz)
Types of Reception	AM, SSB, CW, MCW, and FSK
Noise Figure	Less than 5 dB
Sensitivity (50-ohm input impedance and 1-kHz IF bandwidth)	CW and FSK, 1 kHz to 10 kHz: 5 microvolts for 20 dB (s plus n)/n CW and FSK, 10 kHz to 600 kHz: 0.5 microvolt for 20 dB (s plus n)/n MCW and AM, 50 kHz to 600 kHz: 1 microvolt for 10 dB (s plus n)/n

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SPECIFICATIONS - (Cont'd)

Input Impedance	50 ohms or 1000 ohms, selectable by rear-panel switch
Input Attenuator	0 dB, -20 dB, -40 dB, or -60 dB, selectable by front-panel switch
Maximum Input Level	1 volt, rms, with input attenuator in -60 dB position
IF Bandwidths	150 Hz, 1 kHz, 3 kHz, or 6 kHz, selectable by front-panel switch
Image Rejection	70 dB, minimum
IF Rejection	60 dB, minimum
Dynamic Range	AGC or Manual: 55 dB, minimum
BFO	Five separate BFO's: One variable ±7 kHz by front-panel control and four crystal controlled to provide zero beat with IF frequency, a 5.5-kHz beat note, and upper or lower sideband reception of SSB signals
Incidental FM	Less than 10 Hz peak deviation
Outputs	Six: front-panel phone jack (2000 ohms, nominal); rear-apron audio, 6 milliwatts (600 ohms, balanced); local oscillator output; IF output; AM detector output; and signal monitor output
Audio Bandwidths	Normal (100 Hz to 7 kHz) or narrow (825 Hz to 1175 Hz), selectable by front-panel switch
Input Power	115/230 Vac, 50-400 Hz, approximately 5 watts
Size	19-inches wide, 3.5-inches high, and 19.5-inches deep.
Weight	20 lbs., approximately

FOB Rockville, Maryland. Taxes extra where applicable. Price and specifications subject to change without notice.

Technical Data

DATA SHEET 137.50 8/5/66

TYPE 357 RECEIVER

The 357 is the latest in the line of CEI VLF receivers which started with the popular 351. Its advanced features further enhances CEI's position of leadership in the design and production of general-purpose VLF receiving equipment. The 357 tunes from 1 kHz to 600 kHz in a single band. Four IF bandwidths are provided: 150 Hz, 1 kHz, 3 kHz, and 6 kHz. Crystal bandpass filters are used to determine all IF bandwidths. A four-digit Nixie display is used to indicate the frequency to which the receiver is tuned. By using the display's decimal shift feature, the indicated frequency is within 10 Hz of the received frequency throughout the tuning range.

A digital automatic frequency control (DAFC) circuit in the 357 permits locking the receiver's local oscillator to the counter for the frequency display. In addition to counteracting local oscillator drift, the DAFC circuit, in effect, acts as a frequency synthesizer to provide the equivalent of 60,000 crystal-controlled frequencies, each separated by 10 Hz, when used in the decimal shift mode. Thus the 357 can be locked to a particular frequency whether or not a signal is present.

Also new on the 357 is an extremely effective and fast acting noise canceller circuit which, when used, eliminates all types of impulse noise, such as lightening and ignition, from the receiver's output. The canceller is tunnel-diode triggered to gate off the output for the duration of a noise spike above a preset threshold level. A front-panel control is provided to set the threshold level.

The low incidental FM of the local oscillator and extremely versatile BFO section makes the 357 Receiver suitable for FSK and SSB, as well as AM and CW reception. There are five separate beat frequency oscillators. One has a variable frequency which may be shifted 7 kHz each side of the receiver's 2-MHz IF center frequency. The other four oscillators are crystal controlled and provide outputs which zero beat with the IF frequency, give a 5.5-kHz beat note, and give upper or lower sideband reception of SSB signals (depending on the sideband transmitted) when used with the 3-kHz IF bandwidth.

This extremely versatile receiver has been designed using solid-state devices exclusively except for the frequency display Nixie tubes. It, therefore, exhibits high reliability and low power requirements.

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SPECIFICATIONS

Frequency Range	1 kHz to 600 kHz (Lower Band limit 500 Hz)
Types of Reception	AM, SSB, CW, MCW, and FSK
Noise Figure	Less than 5 dB
Sensitivity (at 50-ohm input impedance and 1-kHz IF bandwidth)	CW and FSK, 1 kHz to 10 kHz: 5 microvolts for 20 dB (s plus n)/n CW and FSK, 10 kHz to 600 kHz: 0.5 microvolt for 20 dB (s plus n)/n MCW and AM, 50 kHz to 600 kHz: 1 microvolt for 10 dB (s plus n)/n
Input Impedance	50 ohms or 1000 ohms, selectable by rear-panel switch
Input Attenuator	0 dB, -20 dB, -40 dB, or -60 dB, selectable by front-panel switch
Maximum Input Level	1 volt, rms, with input attenuator in -60 dB position
IF Bandwidths	150 Hz, 1 kHz, 3 kHz, or 6 kHz selectable by front-panel switch
Image Rejection	70 dB, minimum
IF Rejection	60 dB, minimum
Dynamic Range	AGC or Manual: 55 dB, minimum
Digital AFC	Holds receiver tuning within ±100 Hz of the indicated frequency in the normal AFC mode, and within ±10 Hz in the decimal shift AFC mode.
Noise Canceller	Attenuates receiver output approximately 40 dB for duration of impulse-type noise spikes. Threshold of canceller adjustable by front-panel control.
BFO	Five separate BFO's: One variable ±7 kHz by front-panel control and four crystal controlled: (1) to provide zero beat with IF frequency; (2) a 5.5-kHz beat note; and (3) upper or (4) lower sideband reception of SSB signals.
Incidental FM	Less than 10 Hz peak deviation
Outputs	Six: front-panel phone jack (2000 ohms, nominal); rear-apron audio, 6 milliwatts (600 ohms, balanced); local oscillator output; IF output; AM detector output; and signal monitor output
Audio Bandwidths	Normal (100 Hz to 7 kHz) or narrow (825 Hz to 1175 Hz), selectable by front-panel switch
Power	115/230 vac, 50-400 Hz, approximately 25 watts
Size	19-inches wide, 3.5-inches high, and 19.5-inches deep
Weight	20 lbs., approximately

PRICE: $4,200.00

FOB Rockville, Maryland. Taxes extra where applicable. Price and specifications subject to change without notice.

Technical Data

DATA SHEET 198.50 5/2/66

TYPE RS-111-1B VHF-UHF RECEIVING SYSTEM

The RS-111-1B VHF-UHF Receiving System provides AM-FM-CW reception over the 30-1000 mc frequency range in four bands. A visual display of signals in a band around the received signal is provided. This complete frequency coverage and visual display is packaged into a 5.25-inch high unit designed for rack mounting. Audio and video outputs are provided from a 2-mc IF strip and a selectable 20-kc/75-kc/300-kc IF strip simultaneously. Nuvistors and transistors are used throughout to reduce weight and power consumption.

SPECIFICATIONS

Type of Reception	AM, FM, CW
Frequency Range	30-1000 mc in four bands: Band A, 30-60 mc; Band B, 60-300 mc; Band C, 235-500 mc; Band D, 490-1000 mc
Input Impedance	To operate from 50-ohm source
Noise Figure	Band A, 4 db max; Band B, 6.5 db max; Band C, 10 db max; Band D, 12 db max
Image Rejection	Band A, 60 db min; Band B, 50 db min; Band C, 65 db min; Band D, 75 db min
IF Rejection	Band A, 54 db min; Band B, 80 db min; Band C, 80 db min; Band D, 90 db min
Oscillator to Antenna Conduction	Band A, 15 μv max; Band B, 15 μv max from 60-260 mc and 25 μv max from 260-300 mc; Band C, 8 μv max; Band D, 75 μv max
IF Bandwidths	Four total, two operating simultaneously: 2 mc and either 20 kc, 75 kc, or 300 kc selectable from front panel.
Band A and Band B Sensitivity	
20-kc Bandwidth	AM: 1 μv input, modulated 50%, produces 10 db (s plus n)/n min FM: 2 μv input, modulated at 1 kc with 7-kc deviation, produces 21 db (s plus n)/n min

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Band A and Band B Sensitivity (cont'd)	
75-kc Bandwidth	AM: 2 μv input, modulated 50%, produces 10 db (s plus n)/n min FM: 3 μv input, modulated at 1 kc with 25-kc deviation, produces 21 db (s plus n)/n min
300-kc Bandwidth	AM: 4 μv input, modulated 50%, produces 11 db (s plus n)/n min FM: 6 μv input, modulated at 1 kc with 100-kc deviation, produces 21 db (s plus n)/n min
2-mc Bandwidth	AM: 11 μv input, modulated 50%, produces 10 db (s plus n)/n min FM: 12 μv input, modulated at 1 kc with 750-kc deviation, produces 21 db (s plus n)/n min
Band C and Band D Sensitivity	
20-kc Bandwidth	AM: 2 μv input, modulated 50%, produces 10 db (s plus n)/n min FM: 4 μv input, modulated at 1 kc with 7-kc deviation, produces 21 db (s plus n)/n min
75-kc Bandwidth	AM: 8 μv input, modulated 50%, produces 17 db (s plus n)/n min FM: 6 μv input, modulated at 1 kc with 25-kc deviation, produces 21 db (s plus n)/n min
300-kc Bandwidth	AM: 8 μv input, modulated 50%, produces 10 db (s plus n)/n min FM: 8 μv input, modulated at 1 kc with 100-kc deviation, produces 21 db (s plus n)/n min
2-mc Bandwidth	AM: 22 μv input, modulated 50%, produces 10 db (s plus n)/n min FM: 24 μv input, modulated at 1 kc with 750-kc deviation, produces 21 db (s plus n)/n min
Band A and Band B Output Stability	
20-kc/75-kc/300-kc Bandwidths	AM: Output varies less than 3 db for input range of 2 to 10,000 μv FM: Output varies less than 2 db for input range of 1.5 to 10,000 μv
2-mc Bandwidth	AM: Output varies less than 4 db for input range of 4 to 10,000 μv FM: Output varies less than 4 db for input range of 4 to 10,000 μv
Band C and Band D Output Stability	
20-kc/75-kc/300-kc Bandwidth	AM: Output varies less than 4 db for input range of 4 to 10,000 μv FM: Output varies less than 2 db for input range of 3 to 10,000 μv
2-mc Bandwidth	AM: Output varies less than 4 db for input range of 8 to 10,000 μv FM: Output varies less than 4 db for input range of 8 to 10,000 μv
Outputs from 20-kc/75-kc/300-kc Bandwidth	
Audio Amplifier Response	Within 3 db from 100 cps to 40 kc
Audio Output Power	0.1 watt, min, into 600-ohm load, balanced or unbalanced
Video Amplifier Response	Within 3 db from 50 cps to 150 kc
Video Output Level	5 volts rms across a 10K unbalanced load
Outputs from 2-mc Bandwidth	
FM Video Amplifier Response	Within 3 db from dc to 1 mc
AM Video Amplifier Response	Within 3 db from 30 cps to 1 mc
FM Video Output Level	0.7 volt rms across a 93-ohm load
AM Video Output Level	0.7 volt rms across a 93-ohm load
Fine Tuning	Operates on all bands
Beat Frequency Oscillator	Operates in CW mode on either 20-kc, 75-kc, or 300-kc IF bandwidths
Meter	Tuning
Frequency Display Section	
Sweep Linearity	Within 5% of sweep width
Sweep Width	Continuously adjustable from 0 to 3 mc
Sensitivity for Full Deflection	2.5 μv input to receiver
Resolution	Using approximately 100-kc sweep width, two signals 20-kc apart will be displayed with at least a 6-db valley between the peaks
Power Input	115/230 volts, 50-400 cps
Power Consumption	45 watts, approximately
Weight	35 lbs., approximately
Size	5.25-inches high x 19-inches wide x 15.5-inches deep

Price: $6,250.00

FOB Rockville, Maryland. Taxes extra where applicable. Price and Specifications subject to change without notice.

Technical Data

DATA SHEET 151.50 1/11/66

TYPES 501A AND 504A VHF RECEIVERS

TYPE 504A RECEIVER

The CEI Types 501A and 504A Receivers provide AM, FM, and CW reception in the 54 mc to 260 mc frequency range. The units tune this frequency range in a single band. The 501A and the 504A differ only in the fact that the 504A includes a Crystal Marker Oscillator (CMO) which is not included in the 501A. The CMO allows the operator, by means of front panel controls, to accurately adjust dial calibration to the nearest 1-mc or 5-mc mark on the dial. Two IF bandwidths are included, either 300 kc or 10 kc as determined by a front-panel switch setting.

These receivers include both audio and video outputs on the rear apron. The audio output is designed to operate into a 600-ohm load while the video is designed to work into a high-impedance load. The video bandwidth is adjustable from 1 kc to 150 kc by means of a five-position front-panel switch.

Both receivers have been designed using solid-state devices exclusively. The result is high reliability, low power requirements (approximately 1.5 watts), and a compact package which mounts in a standard 19-inch rack with a panel height of only 3.5 inches.

In addition to the transistorized design, the 501A and 504A also feature a tape dial which offers excellent readability and smooth, trouble-free operation. Other features include a power supply which will operate on either 115 vac or 230 vac at line frequencies from 50 cps to 400 cps, a built-in BFO and Squelch, an output to drive a signal monitor, an IF output, and a local oscillator output.

SPECIFICATIONS

Type of Reception	AM, FM, and CW
Frequency Range	54-260 mc
Input Impedance	50 ohms, nominal
Noise Figure	6.5 db, maximum
Oscillator Radiation at Antenna Input	15 microvolts, maximum
Image Rejection	50 db, minimum

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IF Rejection	70 db, minimum
IF Frequency	21.4 mc
IF Bandwidths	300 kc or 10 kc, selectable by front panel switch
Sensitivity, FM (300 kc bandwidth position)	6 microvolt input produces at least 21 db (s plus n)/n with 100 kc deviation and 1 kc modulation
Sensitivity, AM (300 kc bandwidth position)	4 microvolt input produces at least 10 db (s plus n)/n with 50% modulation at 1 kc
Sensitivity, AM (10 kc bandwidth position)	0.75 microvolt input produces 10 db (s plus n)/n with 50% modulation at 1 kc
FM Output Stability	Output varies less than 2 db for inputs above 1.5 microvolt
AM Output Stability	Output varies less than 3 db for an input level change from 4 μv to 10 mv
Video Response	10 cps to 150 kc
Video Bandwidth Control	5 positions: 1, 3, 10, 30, and 150 kc
Video Output Level	Adjustable by front panel control. Capable of 5 volts rms across 10K ohm load
Beat Frequency Oscillator	Crystal controlled at 21.4 mc; operates with 300-kc or 10-kc bandwidths in CW mode
Audio Output	100 mw into 600 ohms
Pre-detection (IF) Output	21.4-mc output provides 100 mv minimum into a 50-ohm load for input levels above AGC threshold
Local Oscillator Output	50 mv, minimum, into 50-ohm load
Signal Monitor Output	21.4-mc center frequency
Crystal Marker Oscillator (Type 504A only)	Outputs: 1.0 mc or 5.0 mc (harmonics to 300 mc) Frequency Stability: ±0.005% from 0°F to 120°F
Size	19-inches wide, 3.5-inches high, and 15.5-inches deep
Weight	15 lbs.
Power Input	115/230 volts, 50-400 cps
Power Consumption	1.5 watts, approximately

PRICE: 501A - $1,600.00
504A - $1,750.00

FOB Rockville, Maryland. Taxes extra where applicable. Price and specifications subject to change without notice.